

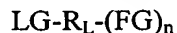
CLAIMS

WHAT IS CLAIMED IS:

1. A process for preparing the polyurethane derivative, the process comprising:

providing a polyurethane comprising a urethane amino moiety;

5 providing a multifunctional linker reagent of a formula:



wherein n is an integer from 1 to 3, FG is a functional group selected from the group consisting of a halogen, a carboxyl group, a sulfonate ester, and an epoxy group, LG is a leaving group selected from the group consisting of a halogen, a carboxyl group, a sulfonate ester, and an epoxy group, and R_L is an (n+1)-valent organic radical comprising at least one carbon atom;

10 providing a protected thiol-containing reagent of a formula R-C(O)SH, or a salt thereof, wherein R is a C₁ to C₆ alkyl group;

reacting the multifunctional linker reagent with the urethane amino moiety to form a polyurethane substituted with at least one substituent group of a formula

15 $-\text{R}_L\text{-(FG)}_n$;

reacting the polyurethane substituted with at least one substituent group with a protected thiol-containing reagent to form the polyurethane comprising the thiol substituent pendant from a urethane nitrogen.

20 2. The process of claim 1, wherein R_L is a bivalent organic radical selected from the group consisting of C₁ to C₁₈ alkylene, C₁ to C₁₈ alkyleneamino, C₁ to C₁₈ alkyleneoxy, C₁ to C₁₈ haloalkylene, C₂ to C₁₈ alkenylene, C₆ to C₁₈ arylene, a modified C₂ to C₁₈ alkenylene having at least one carbon substituted by a halogen group, C₂ to C₁₈ alkenylene having one or more O, S, or N atoms incorporated into an alkenylene chain, a bivalent heterocyclic radical, and mixtures thereof.

25 3. The process of claim 2, wherein R_L is a member selected from the group consisting of C₁ to C₆ alkylene.

4. The process of claim 2, wherein R_L is butylene, FG is a bromo group, LG is a bromo group and n is 1.

5. The process of claim 1, wherein LG is a bromo group.

30 6. The process of claim 1, wherein the sulfonate ester is a member selected from the group consisting of mesylate, triflate, and tosylate.

7. The process of claim 1, wherein the sulfonate ester is a member selected from the group consisting of a ω -bromoalkyl mesylate, a ω -bromoalkyl triflate, and a ω -bromoalkyl tosylate.

8. The process of claim 1, wherein the multifunctional linker reagent is a member
5 selected from the group consisting of a dibromoalkyl compound, a bromo-carboxyalkyl compound, and a bromo-epoxyalkyl compound.

9. The process of claim 8, wherein the dibromoalkyl compound is a 1, ω -dibromoalkyl compound or a substituted 1, ω -dibromoalkyl compound.

10. The process of claim 9, wherein the dibromoalkyl compound is a C₂-C₆1, ω -
10 dibromoalkyl compound.

11. The process of claim 9, wherein the dibromoalkyl compound is 1,6-dibromohexane or 1,4-dibromobutane.

12. The process of claim 8, wherein the bromo-carboxyalkyl compound is a ω -
bromocarboxylic acid or a substituted ω -bromocarboxylic acid.

13. The process of claim 8, wherein the bromo-epoxyalkyl compound is
15 epibromohydrin.

14. The process of claim 1, wherein the process is conducted in a presence of an aprotic solvent.

15. The process of claim 14, wherein the aprotic solvent is a member selected from
20 the group consisting of N,N-dimethylacetamide, N,N-dimethyl formamide, 1-methyl-2-pyrrolidinone, tetrahydrofuran, dioxane, and dimethyl sulfoxide.

16. The process of claim 1, wherein the process is conducted in a presence of a base soluble in the aprotic solvent.

17. The process of claim 16, wherein the base is a member selected from the group
25 consisting of sodium hydride, lithium diisopropylamide, and sodium.

18. The process of claim 16, wherein the base is potassium tert-butoxide, dimethyl
sodium, lithium hydride, sodium amide, lithium N,N-dialkylamide, or lithium N,N-dicyclohexylamide.

19. The process of claim 16, wherein the base is lithium tert-butoxide.

20. The process of claim 18, wherein the multifunctional linker reagent is 1,6-
30 dibromohexane, and the base is lithium diisopropylamide.

21. The process of claim 9, wherein the multifunctional linker reagent is 1,4-
dibromobutane.

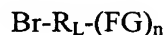
22. The process of claim 1, wherein the protected thiol-containing reagent is thiolacetic acid.

23. The process of claim 1, wherein the protected thiol-containing reagent is tetrabutylammonium thioacetate.

5 24. A process of preparing a polyurethane derivative, the process comprising:
providing a polyurethane;
providing a multi-functional linker, wherein the multi-functional linker has a leaving
group and a functional group;
providing a protected thiol-containing reagent comprising a thiolic moiety;
10 contacting the polyurethane with the multi-functional linker in the presence of an aprotic
solvent and a base such that the leaving group reacts with the polyurethane to form a
polyurethane substituted with at least one substituent group; and
contacting the polyurethane substituted with at least one substituent group with a
protected thiol-containing reagent such that the functional group reacts with the thiolic moiety to
15 form the polyurethane derivative having a reacted thiol substituent pendant therefrom.

25. The process of claim 24, wherein the leaving group is a bromo group and the
functional group is a member selected from the group consisting of halogen, a sulfonate ester, a
carboxyl group, and an epoxy group.

20 26. The process of claim 24, wherein the multi-functional linker is represented by the
formula:



wherein n is an integer from 1 to 3, FG is a functional group selected from the group consisting
of a halogen, a carboxyl group, a sulfonate ester, and an epoxy group, and R_L is an (n+1)-valent
organic radical comprising at least one carbon atom.